This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1   (Currently amended)   A method of determining disturbances when discharging molten metal from a metallurgical container having an outlet into a receiving container, said method comprising the steps of:

   (a) ~~directly or indirectly~~ detecting mechanical vibrations caused by the discharge of molten metal through said outlet;

   (b) measuring a second property in addition to said mechanical vibrations, wherein said second property varies during the discharging of said molten metal from said first metallurgical container to said receiving container;

   (c) calculating a sensitivity constant based upon said measuring of said second property;

   (d) comparing said vibrations detected by said measuring device with a desired vibrational characteristic, wherein said desired vibrational characteristic is defined in part by said sensitivity constant, and wherein said comparing said vibrations is done using a time constant;

   (e) analyzing said comparison to determine the existence of said disturbances within said outlet, wherein said detecting of mechanical vibrations, said measuring of said second property, said calculating of said sensitivity constant, and said comparing of said vibrations with a desired vibrational constant, are each conducted ~~substantially simultaneously with~~ within two seconds of each other; and

(f) causing said disturbances within said outlet to cease.

Claim 2   (Original) The method as recited in claim 1, wherein a flow control gate is disposed between said metallurgical container and said receiving container.

Claim 3   (Original) The method as recited in claim 2, wherein said second property is the position of said flow control gate.

Claim 4   (Cancelled)

Claim 5   (Cancelled)

Claim 6   (Cancelled)

Claim 7   (Currently amended) The method as recited in claim 1, further comprising the step of ~~producing a visual~~ acquiring an image of the area in the vicinity of said receiving container.

Claim 8   (Currently amended) The process as recited in claim 7, wherein said ~~visual~~ image is analyzed to determine a characteristic of the surface of said molten metal, prior to said step of causing said disturbances within said outlet to cease.

Claim 9   (Withdrawn) A method, for determining the presence and quantity of a slag phase in molten steel being transferred in a teeming operation between originating and receiving metallurgical vessels, of the type wherein a real time video image of the teeming stream is monitored to detect the presence of a slag phase, or conditions conducive to the presence of such a phase, in steel being transferred, the monitored images being processed to provide data used to assess the quantity of slag passed, and means operable to control the rate of and termination of teeming is controlled responsive to the data to terminate teeming; wherein parameters of data generated representing characteristics of the teeming stream image are compared with threshold values to

generate at least one signal indicative of the passage of slag, and the threshold values are progressively adjusted responsive to data collected by monitoring plural parameters of the teeming operation selected from predicted teeming duration, weight of the receiving vessel, condition of the means controlling teeming rate, and oxygen content of the molten steel.

Claim 10 (Withdrawn) A method according to claim 9, wherein the means controlling teeming is a tap hole of given diameter, and one of the teeming parameters monitored is selected from the following dependent variables: 1) the cumulative amount of steel passed through the tap hole, or 2) the diameter of the tap hole, or 3) the teeming rate at a given rotation angle of the originating vessel.

Claim 11 (Withdrawn) A method as recited in claim 9, wherein the real time video image is processed using a pass filter that allows the analysis of wavelengths in the near infrared spectrum identified by wavelengths between 700 and 1200 nanometers and excludes lower wavelengths.

Claim 12 (Withdrawn) The method as recited in claim 9, wherein the real time video image is collected by an infrared video camera.

Claim 13 (Withdrawn) The method as recited in claim 9, wherein the characteristics of the teeming stream image includes the division of the teeming stream into bright and dark pixels using a threshold value, the ratio of bright to dark pixels being proportional to the amount of slag passed in any given digitized frame.

Claim 14 (Withdrawn) The method as recited in claim 9, wherein the characteristics of the teeming stream image includes the average and standard deviation of the width of the teeming stream along its length.

Claim 15 (Withdrawn) The method as recited in claim 9, wherein the parameters of the real time video image of the teeming stream and of the teeming operation include derivatives of the parameters with respect to time or other teeming parameters.

Claim 16 (Withdrawn) The method as recited in claim 9, , wherein characteristic image parameter thresholds are modified by the other parameters in accordance with data stored in an expert database.

Claim 17 (Withdrawn) The method as recited in claim 9, wherein the vibration parameter thresholds are modified by neural network analysis.

Claim 18 (Withdrawn) The method as recited in claim 9, wherein the teeming operation is controlled manually in response to generation of the at least one signal.

Claim 19 (Withdrawn) The method as recited in claim 9, wherein the signals generated include a signal indicative of the presence of vortexing in steel being transferred.

Claim 20 (Withdrawn) The method as recited in claim 9, wherein the teeming operation is not terminated but rather the angle of rotation of the originating vessel is adjusted responsive to the signal indicative of vortex so as to suppress vortexing if the monitored parameters indicate the presence in the originating vessel of a significant quantity of transferable steel.